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The NRO: Inside Our Most Secret Spy Agency

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THE NATIONAL Reconnaissance Office, which officially does not exist, is headquartered in a guarded sanctum—4C-956—inside the Pentagon. The NRO's cover, according to a small sign on the outermost of its several doors, is that of the Office of Space Systems, which, in turn, reports to the undersecretary of the Air Force for space systems.

The NRO's cover may be suitably ambiguous, but its mandate is explicit. It is responsible for the design, development and procurement of all U.S. reconnaissance satellites and for their management once in orbit. It does this with the largest budget of any intelligence organization—close to \$5 billion in 1985—and from under a cloak of secrecy so pervasively tight that it is the "blackest" of all of the nation's covert intelligence-related operations.

Besides its headquarters in the Pentagon, the NRO maintains small offices elsewhere in the country from which its employees, mainly engineers trained in the astronautical sciences who also possess security clearances that are among the most stringent obtainable, work with reconnaissance systems' manufacturers, the National Security Agency, the Navy and the Air Force to develop new spy satellites, modify existing ones and make certain that those already in orbit are doing what they are supposed to do.

One NRO site is the Air Force's Satellite Control Facility at Sunnyvale, Calif., about an hour's drive south from San Francisco. The "Big Blue Cube," as it is sometimes called, is the place from which all U.S. military satellites are controlled. Another is the Air Force's Special Projects Office at El Segundo, Calif., which is technically subsidiary to that service's Space Division, also located at El Segundo. In fact, Special Projects is an NRO field office whose engineers work closely with the satellites' contractors and subcontractors on the design level, as well as with the Aerospace Corp., which is located nearby and serves as a think tank

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for military space projects, including reconnaissance and surveillance.

When the Air Force's Consolidated Space Operations Center near Colorado Springs becomes fully operational around 1992, the NRO will be there, if only as an occasional visitor. Since Sunnyvale's Big Blue Cube not only stands above a fault that is considered ripe for a major earthquake but is also within bazooka range of a busy thoroughfare, CSOC has been designed as a second satellite-control facility.

Finally, the NRO has direct ties to the CIA's Directorate of Science and Technology, its Office of SIGINT [Signals Intelligence] Operations, the Navy Space Project office and the NSA, all of which either send it reconnaissance satellite technical requirements or contribute ideas for improving technical collection systems.

The NRO's budget, which is for the most part buried in Air Force expenditures and to a lesser extent in Navy and CIA programs, is immense even by Pentagon standards. Of a total national intelligence budget estimated to be about \$200 billion for the decade of the 1980s, upward of 15 percent, or \$30.8 billion, has been spent or is earmarked for the NRO/Air Force alone. And that does not include another \$2.9 billion spent exclusively by the CIA for research, development, testing and evaluation of new reconnaissance systems as part of its contribution to the NRO, and another \$1.8 billion that will have been spent by the Navy Space Project on its White Cloud ocean reconnaissance satellite systems, another NRO enterprise.

A close reading of federal government budgetary items bearing the program element number 34111 shows that between 1980 and 1989 the NRO/Air Force alone will have spent about \$14.8 billion on procurement (mostly on satellites and the boosters on which they ride to orbit), and close to \$11 billion more on research and development.

The NRO was created on Aug. 25, 1960 in an effort to focus what until then was a technologically fragmented and administratively muddled collection system that was evolving erratically and against a background of internecine warfare—not only inside the Air Force over appropriations but also, far more important, between the Air Force and the CIA. The contest was over "turf"—that part-physical, part-psychological wellspring of power. The players in that game—and to a significant extent that is exactly what it was—competed for control of the nation's sensory system because that was where the power lay.

Throughout 1959 and well into 1960, the Discoverer satellite program (code named Corona) and the Satellite and Missile Observation System (SAMOS), championed by the CIA and Air Force respectively, had competed not only for funding but for the honor of becoming America's preeminent reconnaissance system in the new, wide-open realm of space. Having been forced to share space with NASA when the purportedly civilian space agency was formed in 1958, the Air Force then faced the specter of yet another civilian agency trying to muscle into what it took to be its just domain. The airmen, who had been bruised by the CIA in the acquisition of the first U2s, remained "contemptuous" of the agency and prepared during the spring of 1960 to protect SAMOS, whatever its faults, from the CIA at all costs. The pathetically bungled response to the downing of Francis Gary Powers's U2 on May 1, 1960, further dramatized the need for a tightly coordinated strategic reconnaissance program.

President Eisenhower had been mindful of this. And he also recalled quite clearly that it was the Air Force that had invented the bomber gap and, following that, a missile gap that he was convinced did not exist but which at the moment was causing him serious political problems. The missile gap was another problem, he doubtless reflected ruefully, that would not have happened were it not for the exuberant imagination of senior officers in Air Force intelligence and a seemingly insatiable craving for funding and power by their superiors in the Strategic Air Command and on the Air Staff.

Exasperated, Eisenhower had ordered Thomas S. Gates Jr., his secretary of defense, to have the SAMOS program evaluated and to report the results to the National Security Council. Gates in turn had appointed a panel consisting of Dr. Joseph Charyk, the undersecretary of the Air Force; John H. Rubel, the deputy director of the Defense Department's Directorate of Research and Engineering; and Dr. George B. Kistiakowsky, the Harvard chemist and Los Alamos veteran who had succeeded James Killian as Eisenhower's science adviser.

The most obvious target for the panel's scrutiny was the Air Force's Directorate for Advanced Technology, which coordinated satellite development. What quickly became clear to the panel, however, was that the tangled space reconnaissance situation was a managerial, not a hardware, problem. And the remedy was just as apparent: Create an organization that would oversee the development of space-reconnaissance systems after independently identifying whatever tasks

needed to be accomplished and matching them with technologically feasible solutions. This amounted to a thorough administrative shakeup.

The National Security Council, with Eisenhower in attendance, was duly briefed on the morning of August 25, 1960, just six days after the CIA's Discoverer 14 became the first satellite to have its film capsule snatched in midair. The SAMOS panel's recommendations, as amended by CIA director Allen Dulles and perhaps a few others, formed the basis for the creation of the National Reconnaissance Office. Eisenhower approved the panel's suggestions on the spot. The Air Force was given responsibility for launching and controlling the satellites and for recovering capsules ejected out of orbit by the Discoverer satellites and their descendants. This seemed entirely appropriate because the Air Force owned the rockets and associated hardware and no one dreamed of changing that. But the CIA was theoretically the nation's paramount intelligence-gathering organization (and its leader was nominally in charge of all foreign-intelligence collection), so it was given responsibility to develop the satellites themselves.

The composition of the NRO's leadership had been another knotty problem. The distrust that Ike felt toward some of his former comrades-in-arms and the SAMOS panel members' suspicion of them led to a recommendation that the director of the NRO come from the CIA. But Allen Dulles's political instincts told him that such an arrangement would be dangerous and he therefore would have none of it. It was clear to him that any CIA man who directed the NRO would be a potential scapegoat for the Defense Department in the event of some serious foul-up. As a result, it was decided that the head of the NRO should be the undersecretary of the Air Force and that the organization's second in command would come from the agency.

Three decades and billions of dollars later, the NRO's space-imaging capability has evolved into a pervasive, highly sophisticated intelligence tool. The KH-11 satellite, one of the last of which is now in orbit, can distinguish objects the size of a basketball from 500 miles. And it can do it in a "near-real time"—engineers' jargon for "virtually instantaneous." Its successor, the KH-12, has vastly improved imaging power for night and all-weather observation. It is also highly maneuverable because it can be refueled from space shuttles, making it a harder target to hit and complicating opponents' attempts to keep secrets from its probing eye.

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In the process, NRO's surveillance projects have become intimately connected to Star Wars technology, at least theoretically, according to Robert S. Cooper, a former director of the Defense Advanced Research Projects Agency. In his April 1985 keynote address to the American Institute of Aeronautics and Astronautics' annual meeting in Washington, Cooper said that the early-warning spacecraft now on line—too inaccurate or slow for the new order of battle—would be replaced by a "system based on a staring sensor." That is, a spacecraft placed 22,300 miles from earth will scrutinize one-quarter of the planet at all times, each of its pixels (miniature electronic eyes, 640,000 of which form a mosaic the size of a postage stamp) concentrating on a tract of land or water measuring only about 1,100 yards to a side. It would be able to track thousands of missiles while simultaneously separating them from such extraneous clutter as reflected sunlight, brushfires and moving steam locomotives. It is also expected to be able to make distinctions between real missiles and decoys.

The vulnerability of such satellites' uplinks, downlinks and tracking stations to attack or to natural disaster has been a source of concern for a number of years. Because of this, Cooper said, the "umbilical cord" connecting control facilities on earth to the satellites is going to have to be cut, and it will be necessary to "emulate [the human controllers'] capability on board. We have programs now in artificial-intelligence technology that can take expert knowledge and codify it into intelligent machines." Were a moveable antenna to jam, for example, a self-repairing control system would analyze the problem, study the design of the antenna and its drive components, and then try to get it moving again, perhaps by over-

riding the drive. Failing that, the computer would weigh the importance of that segment of the mission and, if necessary, fire the thrusters so that the entire spacecraft would reposition itself to point the stuck antenna in the right direction.

In the 21st century and beyond, as NRO staff envision it, U.S. reconnaissance and surveillance devices will be responsible for seeing and hearing everything of importance to the national security everywhere on earth and in space, day and night, regardless of the weather. And they will be expected to send their intelligence not only to Washington for dissemination to the National Command Authority, but directly to military units in the field as well.

There will be new types of satellites. One is being designed to watch for laser tests. Another will carry a nuclear-powered radar able to peer through cloud cover by using a giant array the approximate size of a football field that is built of ribs and a membrane thin as tinfoil. The rectangular antenna would be carried to its orbital point in the shape of a cylinder and then unrolled like a giant window shade. Another spacecraft, whose heart is to be a large mosaic of infrared sensors, will stare down from its celestial perch and track individual aircraft and cruise missiles by following the heat they emit.

And plans for an unmanned space station have been in the works for several years, though if they have been finalized, they surely constitute one of the blackest of the NRO's programs. The station would fly a pattern that crosses both poles. "That kind of orbit is well suited to weather forecasting," one Grumman engineer noted.

"And to reconnaissance," someone pointed out.

"Yeah. That, too," the engineer acknowledged before abruptly changing the subject.